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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,256	07/25/2006	Takamasa Koshizen	23085-08069	2473

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EXAMINER	
RUSH, ERIC	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/561,256	KOSHIZEN ET AL.	
	Examiner	Art Unit	
	ERIC RUSH	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-28,30-39,41 and 42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-28,30-39,41 and 42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/11/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 February 2009 has been entered.

Response to Amendment

2. This action is responsive to the amendments and remarks received 24 February 2009. Claims 19 - 28, 30 - 39 and 41 - 42 are currently pending.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 19 - 20, 22 – 28, 30 - 31, 33 - 39 and 41 - 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernd Heisele, Purdy Ho, Tomaso Poggio, "Face Recognition with Support Vector Machines: Global versus Component-based Approach", Proceedings 8th International Conference on Computer Vision, Volume 2, pp. 688 – 694, Vancouver 2001 in view of Paul Viola, Michael J. Jones, "Robust Real-

time Object Detection", Cambridge Research Laboratory, Cambridge, Massachusetts, February 2001, Pages 1 - 25.

- With regards to claims 19 & 30, Heisele et al. teach a method and system for recognizing faces of persons, comprising: a training module configured to train a facial component recognition system to recognize a facial component; (Heisele et al., Section 4, Section 4.1) a population module configured to populate a first knowledge base with facial components and, for each facial component, the facial component's body part classification, wherein the facial components in the first knowledge base include a first set of facial components extracted from facial identification training image data of a face of a first person at a first set of viewpoints; (Heisele et al., Figure 3, Section 4.2, Section 5 Paragraph 1 – Paragraph 2) and an indicator component module configured to determine a first set of body part classifications associated with the first set of facial components (Heisele et al., Fig. 3) and to determine, from the first set of body part classifications, a first body part classification that maximizes a probability that a person class of the facial components in the first set of facial components that are associated with the first body part classification is the first person. (Heisele et al., Section 2, Section 2.1, Section 2.2, Sections 4.1 - 4.2 and Section 3.2) Heisele et al. disclose using a component based approach to facial recognition. They use a plurality of facial components

and input them into a SVM classifier. The components/data are then trained to distinguish a particular face against all other face images. The components are combined into a single feature vector for input into the system. Although, Heisele et al. do not specifically determine a facial component that maximizes a posterior probability that the person class of the first (or second) facial component is the first (or second) person it is known that the training procedure will give weights to each of the components individually with the most weight being associated with the facial component that maximizes a posterior probability that the person class of the first facial component is the first person. Viola et al. teach determining a first feature, body part classification, that maximizes a probability that the first feature belongs to a first class, person class of the facial components in the first set of facial components that are associated with the first body part classification is the first person. (Viola et al., Table 1, Page 7 Lines 24 - 41) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Heisele et al. with the teachings of Viola et al. This modification would have been prompted because both inventions are directed towards similar subject matter. Furthermore, the modification would have been encouraged in order to give the most weight to a singular facial component, feature, which maximally divides the hyper-plane which distinguishes between persons, Heisele et al. Section 4.1.

- With regards to claims 20 and 31, Heisele et al. in view of Viola et al. teach the method and system of claims 41 and 42, respectively. Heisele et al. teach wherein the first body part classification and the second body part classification are different. (Heisele et al., Section 1 Paragraph 4, Section 4.1, Figures 3 and 4) The Examiner notes that the system of Heisele et al. teach training a linear SVM for every person. The training of each is independent of each other which would provide for certain features being more distinguishable to certain persons while other features are more distinguishable to other persons.

- With regards to claims 22 and 33, Heisele et al. in view of Viola et al. teach the method and system of claims 19 and 30, respectively. Heisele et al. teach wherein the indicator component module is further configured to: determine a first conditional probability, that a class is the first person, of the facial components extracted from the facial identification training image data of the face of the first person at a first viewpoint; (Heisele et al., Section 4.2, Section 3.2 Paragraphs 2 - 4, and Section 5 Paragraphs 1 – 2 and Paragraphs 5 - 7) determine a first posterior probability, that a class is the first person, by multiplying the conditional probability at the first viewpoint by a prior probability, that a class is the first person; (Heisele et al., Section 4.2, Section 3.2 Paragraphs 2 - 4, and Section 5

Paragraphs 1 – 2 and Paragraphs 5 - 7) determine a second conditional probability, that a class is the first person, of facial components extracted from facial identification training image data of the face of the first person at an additional viewpoint; (Heisele et al., Section 4.2, Section 3.2 Paragraphs 2 - 4, and Section 5 Paragraphs 1 – 2 and Paragraphs 5 - 7) and determine a second posterior probability, that a class is the first person, by multiplying the second conditional probability by the first posterior probability. (Heisele et al., Section 4.2, Section 3.2 Paragraphs 2 - 4, and Section 5 Paragraphs 1 – 2 and Paragraphs 5 - 7)

- With regards to claims 23 and 34, Heisele et al. in view of Viola et al. teach the method and system of claims 22 and 33, respectively. Heisele et al. teach wherein the prior probability, that the class is the first person, comprises one Nth where N is a number of person classes. (Heisele et al., Section 4.2, and Section 3.2 Paragraphs 2 - 4)

- With regards to claims 24 and 35, Heisele et al. in view of Viola et al. teach the method and system of claims 19 and 30, respectively. Heisele et al. teach the method and system further comprising a storage module configured to store, in a second knowledge base, the facial components in the first set of facial components that are associated with the first body part classification. (Heisele et al., Abstract, Section 1 Paragraph 1, and

Section 5 Paragraph 1, although Heisele et al. is silent to a storage module it is implicit from the discussion of using SVM recognition for every person in a database, as well as the recording of the test set)

- With regards to claims 25 and 36, Heisele et al. in view of Viola et al. teach the method and system of claims 24 and 35, respectively. Heisele et al. teach the system and method further comprising a receiving module configured to receive facial components at various viewpoints of a person to be identified; (Heisele et al., Section 5 Paragraph 1 – Paragraph 2) and an identification module configured to identify the person using a facial component stored in the second knowledge base. (Heisele et al., Section 1 Paragraph 4, Section 4.1, Figures 3 and 4)

- With regards to claims 26 and 37, Heisele et al. in view of Viola et al. teach the method and system of claims 41 and 42, respectively. Heisele et al. teach wherein the first set of viewpoints and the second set of viewpoints are different. (Heisele et al., Section 5 Paragraph 1 – Paragraph 2 and Paragraphs 5 - 7)

- With regards to claims 27 and 38, Heisele et al. in view of Viola et al. teach the method and system of claims 19 and 30, respectively. Heisele et al. teach wherein the training module is further configured to: receive facial

component training image data of faces of persons at various viewpoints; (Heisele et al., Section 5 Paragraphs 1 - 2) extract facial components at various viewpoints from the facial component training image data of faces of persons at various viewpoints; (Heisele et al., Section 4.1 – 4.2) and train a body part classifier module using the extracted facial components. (Heisele et al., Section 5 Paragraphs 1 - 2)

- With regards to claims 28 and 39, Heisele et al. in view of Viola et al. teach the method and system of claims 27 and 38, respectively. Heisele et al. teach wherein the body part classifier module performs one-versus-all classification. (Heisele et al., Section 4.2 and Section 5 Paragraphs 1 - 2)

- With regards to claims 41 and 42, Heisele et al. in view of Viola et al. teach the method and system of claims 19 and 30, respectively. Heisele et al. teach wherein the facial components in the first knowledge base further include a second set of facial components extracted from facial identification training image data of a face of a second person at a second set of viewpoints, (Heisele et al., Section 3.2, the system has a linear SVM for every person in the database) and wherein the indicator component module is further configured to determine a second set of body part classifications associated with the second set of facial components and to determine, from the second set of body part classifications, a second body

part classification that maximizes a probability that a person class of the facial components in the second set of facial components that are associated with the second body part classification is the second person. (Heisele et al., Section 2, Section 2.1, Section 2.2, Sections 4.1 - 4.2 and Section 3.2) Heisele et al. disclose using a component based approach to facial recognition. They use a plurality of facial components and input them into a SVM classifier. The components/data are then trained to distinguish a particular face against all other face images. The components are combined into a single feature vector for input into the system. Although, Heisele et al. do not specifically determine a facial component that maximizes a posterior probability that the person class of the first (or second) facial component is the first (or second) person it is known that the training procedure will give weights to each of the components individually with the most weight being associated with the facial component that maximizes a posterior probability that the person class of the first facial component is the first person. Viola et al. teach determining a second feature, body part classification, from the second set of body part classifications that maximizes a probability that the second feature belongs to a second class, person class of the facial components in the second set of facial components that are associated with the second body part classification is the second person. (Viola et al., Table 1, Page 7 Lines 24 - 41)

5. Claims 21 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernd Heisele, Purdy Ho, Tomaso Poggio, “Face Recognition with Support Vector Machines: Global versus Component-based Approach”, Proceedings 8th International Conference on Computer Vision, Volume 2, pp. 688 – 694, Vancouver 2001 in view of Paul Viola, Michael J. Jones, “Robust Real-time Object Detection”, Cambridge Research Laboratory, Cambridge, Massachusetts, February 2001, Pages 1 - 25 as applied to claims 19 and 30 above, and further in view of Paul Viola, “Complex Feature Recognition: A Bayesian Approach for Learning to Recognize Objects," AI Memo No. 1591, Artificial Intelligence Laboratory, MIT, Cambridge, MA, November 1996, herein referred to as Paul.

- With regards to claims 21 & 32, Heisele et al. in view of Viola et al. teach the method and system of claims 19 and 30, respectively. Heisele et al. fail to teach wherein the indicator component module is further configured to determine the first body part classification using Bayesian estimation. Paul teaches wherein the indicator component module is further configured to determine the first body part classificaiton using Bayesian estimation. (Viola, Abstract, Figures 1 and 2, and Section 2 Paragraphs 1 – 5) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Heisele et al. in view of Viola et al. to include the teachings of Paul. This modification would have

been prompted in order to aid in the efficient processing and recognition of complex images, such as faces. This approach is well known in the art and would be obvious to include in the training algorithm especially when various viewpoints are involved.

Response to Arguments

6. Applicant's arguments with respect to claims 19 and 30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Perona et al. U.S. Patent No. 7,280,697; which is directed to an unsupervised learning of object categories from cluttered images.
- Bernd Heisele et al., “Feature Reduction and Hierarchy of Classifiers for Fast Object Detection in Video Images”, Computer Vision and Pattern Recognition, IEEE Computer Society Conference Vol. 2, 2001, Pages 18 - 24; which is directed to SVM as classifiers and feature reduction by choosing relevant image factures according to a measure derived from statistical learning theory.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC RUSH whose telephone number is (571)270-3017. The examiner can normally be reached on 7:30AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew C Bella/
Supervisory Patent Examiner, Art Unit 2624

ER